CLAIMS

1. A corona discharge ionizer which emits ions generated by corona discharge to a subject to be neutralized, comprising:

an emitter;

a voltage supply unit which applies voltage to the emitter;

an annular control electrode to which control electrode voltage is applied or which is grounded to zero potential; and

a shield body formed such as to include a cylindrical portion which cover a periphery of the emitter, wherein

the control electrode is disposed in a cylindrical portion of the shield body and at a location where ions are balanced, and when a cylindrical inner diameter of the shield body is defined as Ds and an annular outer diameter of the control electrode is defined as Dc, $2Dc<Ds$ is satisfied.

2. The corona discharge ionizer according to claim 1, further comprising an air supply unit which supplies air from the emitter toward the subject to be neutralized.

3. The corona discharge ionizer according to claim 2, wherein

the air supply unit includes an air supply pipe which forms a space which is covered from external other than an air supply opening from which the emitter projects, and which is grounded and which also functions as a shield body, and

an air supplier in which the air supply pipe and a flow path are in communication with each other,

when an interior of the air supply pipe is pressurized and air is supplied to the interior, the air supply pipe supplies air from the air supply opening toward the subject to be neutralized, and an electric field generated from the emitter by an electrostatic shield function is shut off.

4. The corona discharge ionizer according to any one of claims 1 to 3, further comprising an insulating coating portion which is coated by the emitter such as to cover in a substantially cylindrical form, wherein

an annular inner peripheral surface of the control electrode is disposed such that the annular inner peripheral surface is in contact with the insulating coating portion.

5. The corona discharge ionizer according to any one of claims 1 to 3, wherein

the emitter is a hollow pipe and is formed at its tip end with a nozzle, and gas is injected from the nozzle.

6. The corona discharge ionizer according to claim 4, wherein

the emitter is a hollow pipe and is formed at its tip end with a nozzle, and gas is injected from the nozzle.